
Formatting Instructions For NeurIPS 2022

Huy Quang Lai

Department of Computer Science and Engineering
Texas A&M University
College Station, Texas 77843
lai.huy@tamu.edu

1 Implement Cross Entropy Cost

There is no writing part for this question.

2 Multi-class Perceptron

$$g(w_0, \dots, w_{C-1}) = \frac{1}{P} \sum_{p=1}^P \left[\max_{j=0, \dots, C-1} \left(0, -y_p \mathbf{x}_p^T \mathbf{w}_j \right) - \mathbf{x}_p^T \mathbf{w}_{y_p} \right]$$

When $C = 2$, the multi-class Perceptron cost reduces to the two-class version.

$$g(\mathbf{w}) = \frac{1}{P} \sum_{p=1}^P \max \left(0, -y_p \mathbf{x}_p^T \mathbf{w} \right)$$

3 Complete ML Pipeline

3.1 Data Preprocessing

No writing for this part

3.2 Hyperparameter Tuning

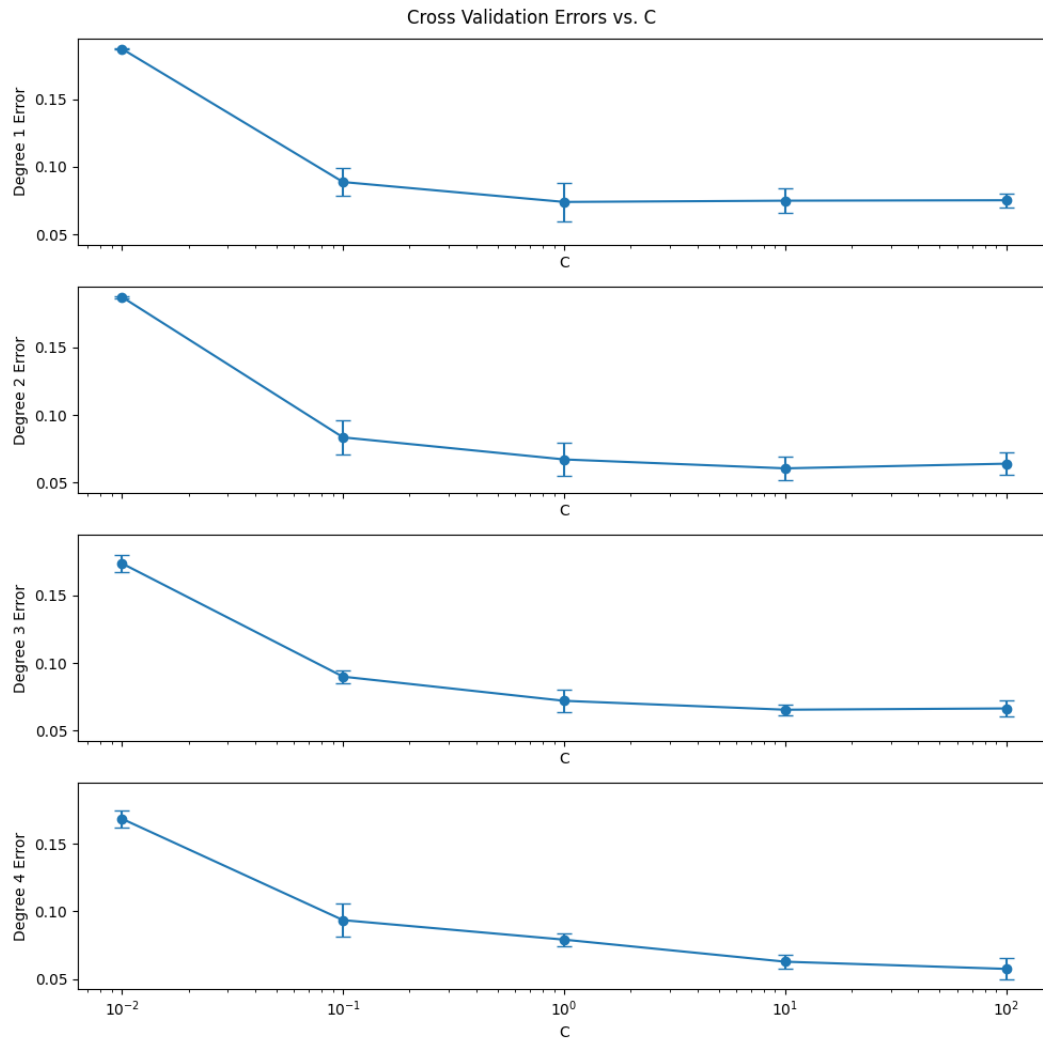


Figure 1: Cross Validation Errors vs C

3.3 Model Training and Testing

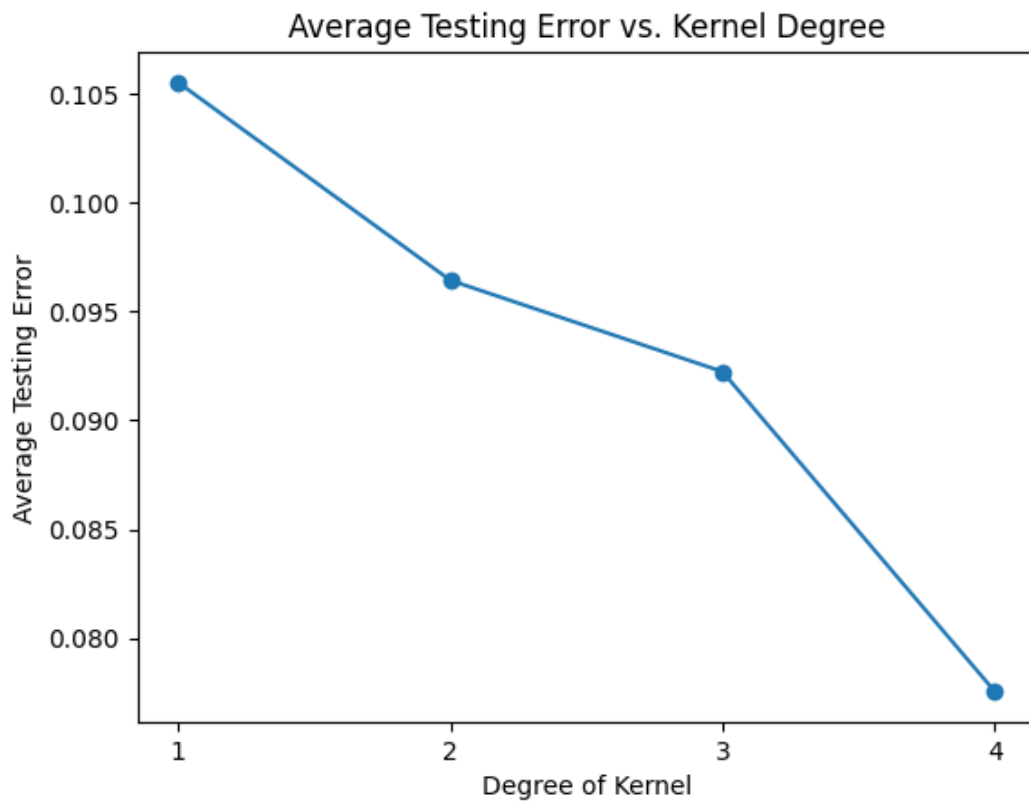


Figure 2: Average Testing Error

3.4 Results Evaluation

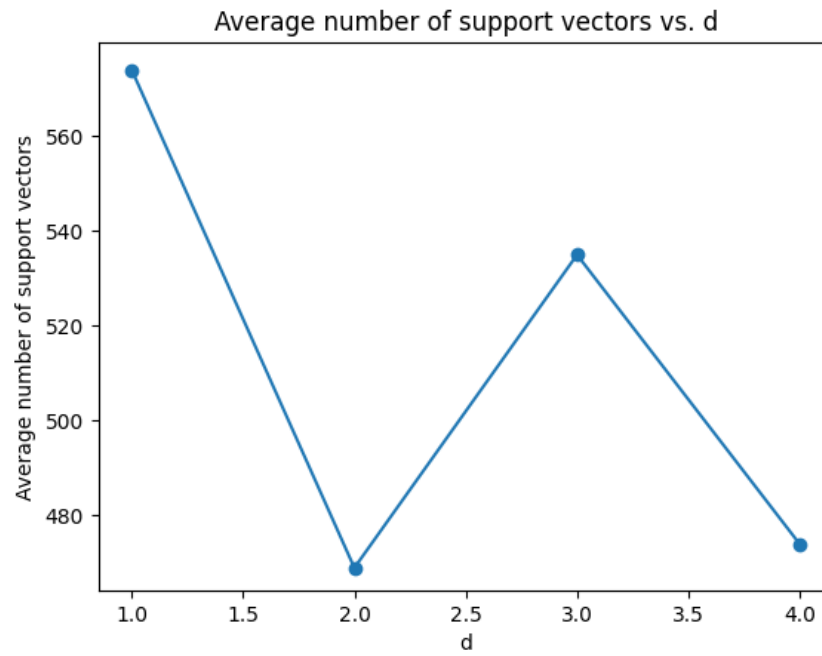


Figure 3: Average Number of Support Vectors

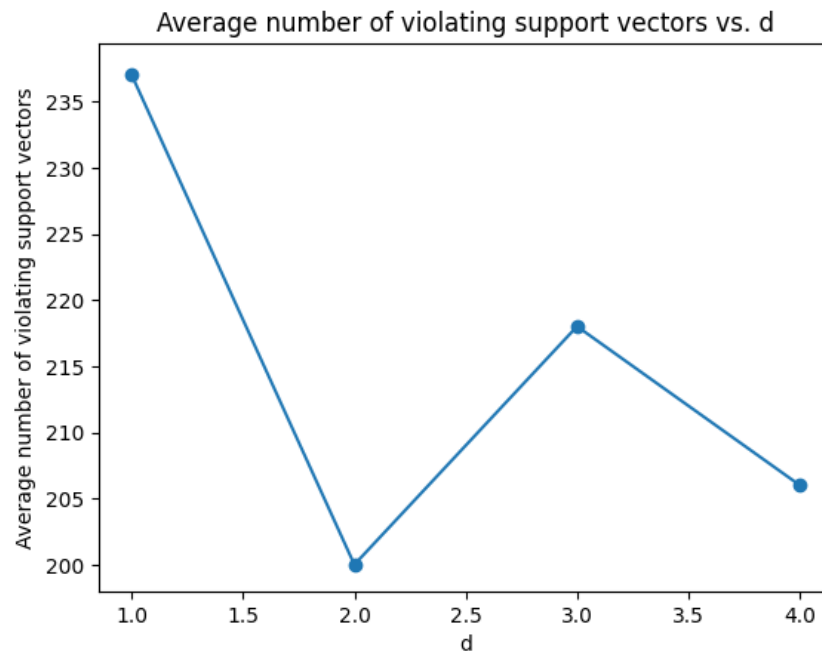


Figure 4: Average Number of Violating Support Vectors

3.5 Conceptual

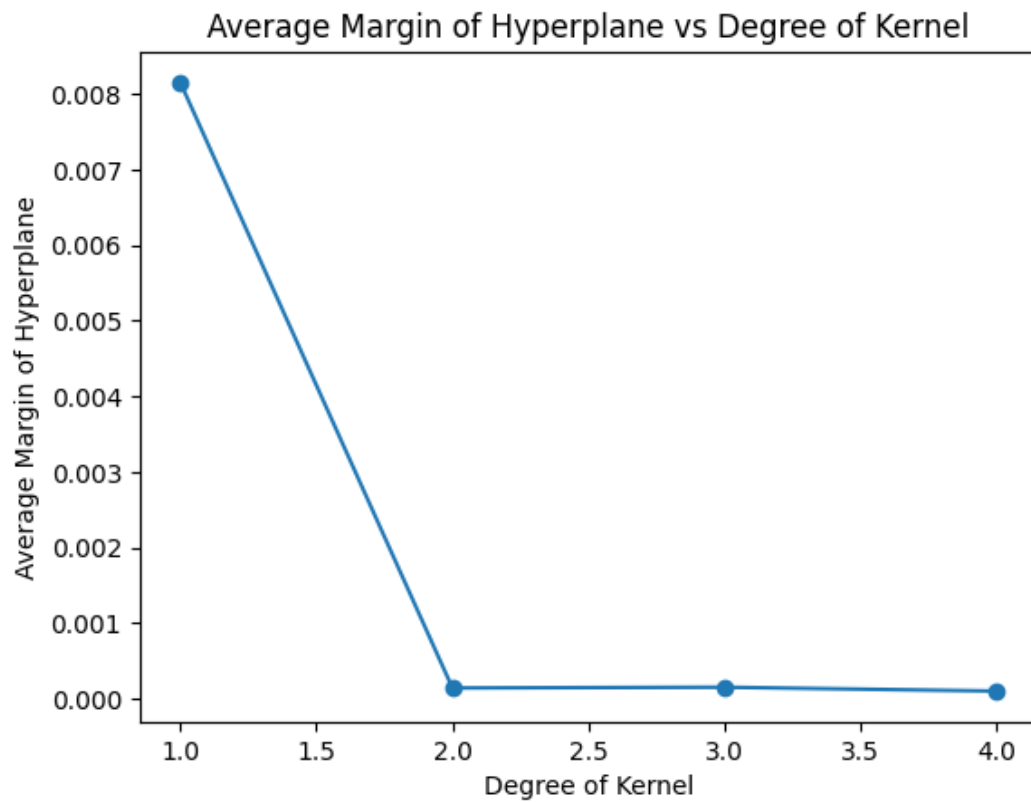


Figure 5: Average Margin of Hyperplane

References

- [1] Watt, Jeremy, Borhani, Reza & Katsaggelos, Aggelos Konstantinos (2016) Machine Learning Refined.
- [2] Konasani, Venkata Reddy & Shailendra Kadre (2021) Machine Learning and Deep Learning Using Python and TensorFlow.